AMENDMENTS TO THE SPECIFICATION:

Please replace the following numbered paragraphs with the following rewritten paragraphs:

[3]   The zero torque value at the gear interface changes dynamically with such factors as road conditions, vehicle condition, vehicle configuration, vehicle acceleration/deceleration, overall drive ratio, and engine drag during coast among others. A zero torque target at the gear interface must normally be obtained using some combinations of measurements and/or physical models.

[6]   The transmission system according to the present invention relates the relative movement of vehicle components to determine the onset of zero relative torque to permit a shift change to be effected at approximately zero relative torque. Generally, when a predetermined signature is identified which relates to the onset of zero relative torque, the transmission shift controller initiates a shift. Absolute torque of the components is irrelevant but relates the relative torques present at the gear interface or some other point in the power path for that interface are utilized by the present invention.

[24]   The controller 46 communicates with a first sensor 58 adjacent the first shaft 52 and a second sensor 60 59 adjacent the second shaft 54. When the shift controller 46 identifies a relative movement signature indicative of a zero relative torque between the first and second shaft 52, 54 shifting of the gear interface 56 is initiated. It should be understood that the gear interface may be any gear interface within the transmission 26.

[27]   It should be understood that any number of components that have a relative movement capability within the vehicle driveline 20 ~~will benefit fromcan be utilized with~~ the present invention. Relating the relative movement to the approach of zero relative torque permits shift changes to be effected at approximately zero relative torque. Generally, when a predetermined signature is identified which relates to the onset of zero relative torque the controller initiates a shift. That is, absolute torque of the components is irrelevant as the present invention relates the relative torques adjacent the gear interface

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or some other point in power path for that interface to effect a shift. The measurement of zero relative torque using that torque's effect on the system is, for example and as will be further described below, achieved through the measurement of torsional compliance at the clutch, measurement of torsional compliance in the transmission, measurement of the vibration signature from one or more speed sensors, measurement of the vibration signature from one or more acceleration sensors, and/or relative movement of two components.

[28]   Referring to Figure 3 and as explained with regard to Figure 2, a torsional damper 60 is located within a vehicle clutch 24a as generally known. The torsional damper 60 permits relative movement between an engine shaft 23a and the transmission input shaft 28a when engaged by the clutch 24a. This relative movement results in a relative position change between the engine shaft 23a and the input shaft 28a in response to changing torque. A difference in relative position which indicates that the system is approaching zero relative torque. Sensor 62, 63 in communication with the shift controller 46 identifies the relative movement, and from that relative movement derives the relative driveline torque such that a shift is effected at approximately zero torque.

[31]   Referring to Figure 6, an elastomeric coupling 70 that permits torsional compliance that amplifies relative movement between a first shaft 72 and a second shaft 74. A first sensor 73 and a second sensor 75 are located adjacent each shaft 72, 74 to identify relative movement due to torsional deflection of the elastomeric coupling 70. It should be understood that the elastomeric coupling magnifies the torsional movement and that movement across the sensor could be utilized without the elastomeric coupling 70. Such an arrangement may be utilized anywhere within the driveline.

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